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EXAMINER

KIM, EUNHEE

ART UNIT

PAPER NUMBER

2123

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/679,427	Applicant(s) TAYLOR ET AL.	
	Examiner Eunhee Kim	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

1. The amendment filed 06/17/2008 has been received and considered. Claims 23-43 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 23 and 39 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for placing first geometric construct into a second geometric construct, does not reasonably provide enablement for defining a neutronic characteristic of the second geometric construct as if the second geometric construct geometric construct were completely filled with a plurality of the first geometric constructs without explicitly placing the first geometric construct throughout the second geometric construct. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. After placing first geometric construct into a second geometric, how does the step of defining a neutronic characteristic of the second geometric construct take place without explicitly placing the first geometric construct throughout the second geometric construct? Once first geometric construct into a second geometric, how is it enabled to not placing the first geometric construct to determine a neutronic characteristic of the second geometric construct?? Once first geometric constructs are placed in a second geometric, how come the second geometric construct were

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completely filled with a plurality of the first geometric constructs without placing the first geometric?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claim 23-26, 28-29, 31-38, and 39-43 are rejected under 35 U.S.C. 103(a) being unpatentable over Haruyama (US Pub No. 2003/0012324), in view of Solid Edge (User's Guide of Solid Edge), and further in view of Iverson (US H744).

As per claims 23, 32, 33, and 39, Haruyama teaches a method of modeling a fissile system in a neutronics modeling method (Fig. 11-13, [0041]-[0043]) comprising:

(Claims 23, 32, 33, and 39) defining at least one neutronic characteristic of the second geometric construct as if the second geometric construct were completely filled with a plurality

of the first geometric constructs without explicitly placing the first geometric construct throughout the second geometric construct (Fig. 11-13, [0041]-[0043]);

the second geometric constructs (Fig. 11-13, [0041]-[0043]); and

(Claims 33 and 39) defining at least one neutronic characteristic of the third geometric construct as if the third geometric construct contains the at least one second geometric construct based on the placement and neutronic characteristics of the at least one second geometric construct (Fig. 11-13, [0041]-[0043]).

Haruyama fails to teach explicitly (Claims 23, 32, 33, and 39) placing at least one first geometric construct into a second geometric construct; and

(Claims 23, 32, and 39) performing a criticality analysis on the fissile system and the first construct.

(Claims 33 and 39) placing at least one of the second geometric construct into a third geometric construct.

Solid Edge teaches (Claims 23, 32, 33, and 39) placing at least one first geometric construct into a second geometric construct (Pages 69 and 33, Chapter 2, Pages 195- 229, 252, 260-263); and

(Claims 33 and 39) placing at least one of the second geometric construct into a third geometric construct (Pages 69 and 33, Chapter 2, Pages 195- 229, 252, 260-263).

Iverson teaches (Claims 23, 32, and 39) performing a criticality analysis on the fissile system (Col. 5 lines 59-67, col. 6 lines 1-4).

Haruyama, Solid Edge, and Iverson are analogous art because they are both related to a computer analysis.

Therefore, it would have been obvious to one of ordinary skill in the art of at the time the invention was made to include placement of geometric construct of Solid Edge and criticality analysis of Iverson, with the method of fissile system of Haruyama to increase software performance with an interface that ensures maximized user productivity (Solid Edge: Page 2). Furthermore, Iverson teaches safer design of processing and storage equipment (Col. 2 lines 14-32).

As per claims 24, Haruyama teaches wherein the second geometric construct is a region to be modeled in a neutronics modeling method (Fig. 11-13, [0041]-[0043]).

As per claim 25, 26, and 28-29, Haruyama fails to teach explicitly (Claim 25) wherein the first geometric construct includes a generally rectangular body having curved surfaces on the generally rectangular body;

(Claim 26) wherein the curved surfaces are shaped as a portion of a surface of a cylinder or a sphere;

(Claim 28) wherein the first geometric construct is formed by forming at least one interstitial region, the first geometric construct being formed by boundaries of the at least one interstitial region;

(Claim 29) wherein the boundaries of the at least one interstitial region are shaped such that the formed first geometric construct is cylindrical or spherical; and

Solid Edge teaches (Claim 25) wherein the first geometric construct includes a generally rectangular body having curved surfaces on the generally rectangular body (Page 34 and 75, Chapter 2);

(Claim 26) wherein the curved surfaces are shaped as a portion of a surface of a cylinder or a sphere (Page 34 and 75, Chapter 2);

(Claim 28) wherein the first geometric construct is formed by forming at least one interstitial region, the first geometric construct being formed by boundaries of the at least one interstitial region (Page 34 and 75, Chapter 2); and

(Claim 29) wherein the boundaries of the at least one interstitial region are shaped such that the formed first geometric construct is cylindrical or spherical (Page 34 and 75, Chapter 2).

As per claims 31 and 38, Haruyama teaches geometric construct and wherein each geometric construct represents an object in a fissile system and has associated neutronic characteristics of the represented objects (Fig. 11-13, Solid Edge: Page 34 and 75, Chapter 2)

Haruyama fails to teach explicitly an effective neutron multiplication factor of a modeled system.

Iverson teaches an effective neutron multiplication factor of a modeled system (Col. 5 lines 60-68, Col. 6 lines 1-4).

As per claim 34, Haruyama teaches neutronic characteristics.

Haruyama fails to teach explicitly repeated N times with Nth geometric constructs so as to form a plurality of levels of embedded geometric constructs and placement of geometric constructs, and wherein N is a positive integer (Fig. 11-13, [0041]-[0043]).

Solid Edge teaches repeated N times with Nth geometric constructs so as to form a plurality of levels of embedded geometric constructs and placement of geometric constructs, and wherein N is a positive integer (Page 34 and 75, Pages 195- 229, 252, 260-263, Chapter 2).

As per claims 35 and 41, Haruyama teaches the first geometric and second constructs do not possess identical neutronic characteristics (Fig. 11-13, [0041]-[0043]).

As per claim 36 and 40, Haruyama fails to teach explicitly wherein a plurality of the first geometric constructs are placed into the second geometric construct and at least two first geometric constructs of the plurality of first geometric constructs spatially overlap and form an overlapping region within the second geometric construct.

Solid Edge teaches wherein a plurality of the first geometric constructs are placed into the second geometric construct and at least two first geometric constructs of the plurality of first geometric constructs spatially overlap and form an overlapping region within the second geometric construct (Page 34 and 75, Pages 195- 229, 252, 260-263, Chapter 2).

As per claim 37, Haruyama teaches defining at least one neutronic characteristic of the second geometric construct (Fig. 11-13, [0041]-[0043]).

Haruyama fails to teach explicitly rotating the first geometric construct within the second geometric construct and placement and the rotation of the first geometric construct.

Solid Edge teaches rotating the first geometric construct within the second geometric construct and placement and the rotation of the first geometric construct (Page 34 and 75, Pages 195- 229, 252, 260-263, Chapter 2).

As per claim 42, Haruyama teaches neutronic characteristic of one second geometric construct of the at least two second geometric constructs.

Haruyama fails to teach explicitly forming the overlapping region.

Solid Edge teaches forming the overlapping region (Page 34 and 75, Pages 195- 229, 252, 260-263, Chapter 2).

As per claim 43, Haruyama wherein the one second geometric construct of the at least two second geometric constructs forming the overlapping region is chosen based on its inherent priority or user input.

Solid Edge teaches wherein the one second geometric construct of the at least two second geometric constructs forming the overlapping region is chosen based on its inherent priority or user input (Page 34 and 75, Pages 195- 229, 252, 260-263, Chapter 2).

4. Claim 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haruyama (US Pub No. 2003/0012324), in view of Solid Edge (User's Guide of Solid Edge), in view of Iverson (US H744), further in view of Kitamura et al. (US Patent No. 5,936,628).

Haruyama as modified by Solid Edge and Iverson teaches most all of the instant invention as applied to claims 23-26, 28-29, 31-38, and 39-43 above.

Haruyama as modified by Solid Edge and Iverson teaches (Claim 27) the curved surfaces are shaped (Solid Edge: Page 34 and 75, Chapter 2); and

(Claim 30) the boundaries of the at least one interstitial region are shaped such that the formed first geometric construct is shaped according (Solid Edge: Page 34 and 75, Chapter 2).

Haruyama as modified by Solid Edge and Iverson fails to teach explicitly quadratic surface equations

Kitamura et al. teaches quadratic surface equations (Col. 13 lines 45-59).

Haruyama as modified by Solid Edge and Iverson and Kitamura et al. are analogous art because they are both related to a modeling.

Therefore, it would have been obvious to one of ordinary skill in the art of at the time the invention was made to include quadratic surface equations of Kitamura et al., with the method of fissile system of modeling of Haruyama as modified Solid Edge and Iverson because Kitamura et al. teaches advantages of the system that can be utilized effectively (Col. 3 lines 12-20).

Response to Arguments

5. Applicant's arguments filed 01/07/2008 have been fully considered but they are not persuasive.

Applicants have argued, with respect to 112 rejections, that:

See Spec ¶¶ [0030], [0097]; FIG. 15C. Thus, as stated in the specification as filed, because a neutron may continuously interact with a first geometric construct based on characteristics of the first geometric construct while inside the bounds of a second geometric construct, an "average" neutronic characteristic of a second geometric construct may be defined as if it were filled with a first geometric construct based on a single instance of the first geometric construct, as recited in claims 23 and 39.

Applicant's arguments regarding the 112 rejections are not wholly persuasive. Claims 23 and 49 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the express teachings, does not reasonably provide enablement for any teachings implied by the use of "may", but which are not actually disclosed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Thus, *Claim Rejections - 35 USC § 112* are maintained.

Applicants have argued that:

Applicants respectfully submit that the claims are method claims; no structure is being claimed. Terms of intended use in method claims must be given patentable weight, as they define the claimed method. See MPEP § 2114 (ignoring intended use only for apparatus claims). Thus, the method step of defining neutronic characteristics "as if the second geometric construct were completely filled with a plurality of the first geometric constructs" must be met by the applied references in order to render the method obvious. [1]

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However, Applicants respectfully submit that Haruyama fails to teach or suggest "defining at least one neutronic characteristic of the second geometric construct as if the second geometric construct were completely filled with a plurality of the first geometric constructs." Haruyama teaches no geometric construct completely filled with another or neutronic characteristics defined by such filling. Rather, FIGS. 11-13 of Haruyama illustrate measuring radioactivity of containers of different geometries and contents. See Haruyama, q[[0041]-[0043] and [0065]-[0067]. This measurement is not a modeling system nor is it filling any region or defining a region as if it were filled for determining a neutronic characteristic of the region for such modeling.

As per [1], the examiner takes the position that "as if the second geometric construct were completely filled with a plurality of the first geometric constructs" is a recitation of the intended use which the claim further states is not to be used as shown in the limitation "without explicitly placing the first geometric construct throughout the second geometric construct". Further, the examiner takes the position that Haruyama teaches solid radioactive waste that is positioned between the neutron detector and the pair of neutron generating tubes in a face-to-face relationship that corresponds to "defining at least one neutronic characteristic of the second geometric construct".

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eunhee Kim whose telephone number is 571-272-2164. The examiner can normally be reached on 8:30am-5:00pm Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eunhee Kim/
Examiner, Art Unit 2123

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit 2123